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OBSERVATIONS ON THE NESTING OF THE THREE-BANDED PLOVER

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While I was being detained by guerillas between June 1976 and early January 1977, observations were made of a pair of Three-banded Plovers which occurred on an 800 m stretch of a small, shallow river in north-east Eritrea. The river flowed in part of a sandy wadi, at one point passing through a narrow gorge; here there were several small waterfalls and two deeper pools. Between the falls was a series of tiny tributaries from hot springs at one edge of the wadi. Down-river from the lower pool the wadi widened and, after c.300 m, the river disappeared into the sand. Occasional flash floods temporarily filled the whole width of the wadi with water. Nomads with their camels and goat herds frequently visited the wadi for water and, in the early mornings and evenings, a stream of guerillas, sometimes numbering well over a hundred individuals, passed up and down the wadi.

The pair of plovers was first seen on 8 June and daily thereafter, usually feeding by the river below the second pool or up in the springs area. When disturbed, the birds were reluctant to fly but ran quickly along the edge of the river, bobbing up and down whenever they paused. A small scrape cleared of large pebbles and lined with small ones was found between the river and a cliff on 17 June. One egg was laid during 24 June and a plover was incubating on 25 June. The nest was not disturbed until 29 June when the incubating bird was flushed to establish the clutch size, which was one. Mackworth-Praed & Grant (1957) give the clutch size for most small African *Charadrius* species as two or rarely three, but Harrison (1975) noted that in Kittlitz's Sand Plover *C. pecuarius* the clutch, although usually two, is occasionally one.

My movements were very restricted by the guerillas and visits to the river were only allowed in the evenings. Observations were therefore usually made during half to one hour periods each evening between 15.00 and 18.00 hrs local time (dusk was c.19.15 hrs in June), occasionally earlier. Probably because observations were made at a relatively cool time of the day I did not see adults crouching during incubation, feather-raising or belly-soaking - patterns of behaviour associated with heat loss from adults during incubation (Reynolds 1977). No change-over of the adults at the nest was seen either. In other *Charadrius* species it is known that both sexes share incubation and it is probable that the Three-banded Plover is no exception. The incubating bird was very tame, sometimes allowing an approach to within 3 m before slipping off the nest and running quickly to the edge of the river, soon returning to the egg when danger had passed. When disturbed from its nest, the Three-banded Plover never kicked or scuffled sand or stones over the egg to cover it, as does the Kittlitz's Sand Plover and sometimes the White-fronted Sand Plover

C. marginatus (Hall 1960, Martin 1971). If an intruder came near the nest, elaborate distraction displays were performed: the bird approached the intruder to within a metre and called excitedly; it then shuffled away down-river, crouching as it moved, with its head jerking up and down and tail raised, and sometimes holding out its wings; then it paused but, if followed, it again moved away, so leading the intruder 30-40m from the nest. Then it flew back beyond the nest, sometimes 200-300m upriver. When an adult returned to the nest it flew back to the river edge but walked the last few metres to the nest. Martin (1971) found that Three-banded Plovers in South Africa left their nest when an intruder was a long way off, first running a few paces and then flying up to half a mile (800m) away. The Eritrean birds apparently behaved more like Martin's White-fronted Sand Plovers which allowed a closer approach by an intruder and then rose from the nest and sneaked off unobserved. However, the birds in Eritrea were accustomed to people walking daily along the wadi.

Incubation continued for 17d until 11 July when a passing herd of goats broke the egg. Both adults were seen daily after the egg had been destroyed and still performed distraction displays when intruders were in the vicinity of the old nest, but searches for a new nest were fruitless. Between 22 July and 10 September there were a number of flash floods which would have destroyed any possible nests. On 23 September a plover attempted to drive away a Wood Sandpiper *Tringa glareola* from a raised pebble bank by the lower pool, about 20m from the first nest. A scrape was found but it remained empty for at least four days. On 15 October a plover vigorously attacked a Squacco Heron *Ardeola ralloides* which was feeding by the pool; the plover rushed at the Squacco and flew up at it. On 16 October a check revealed two eggs in the scrape. On 24 October at 17.30hrs a dry chick was moving about close to the nest on which an adult still sat. The second egg had hatched by 07.00hrs the following day when an adult was leading the two chicks on to mud between the nest and pool, which was silting up. If it is assumed the first egg was laid on 28 September at the earliest, and the second after an interval of two days, the incubation period was 26d or less.

Both chicks survived despite more floods and much disturbance by passing people. The adult plovers both tended the chicks but usually only one adult guarded them at a time. The off-duty bird fed up by the springs or where the river disappeared into the sand, and where aquatic invertebrates and tadpoles were often stranded. The off-duty bird, even when several hundred metres from the chicks, would shuffle along calling in an agitated way a few metres in front of an intruder. The duty bird also performed distraction displays to humans near the pool but was now more tolerant of birds such as Squaccos and sandpipers. The change-over of adults with the chicks was seen on four occasions. The off-duty bird returned to the edge of the pool and fed there until its mate walked or ran from the chicks to join it; it then walked up to the chicks and the relieved bird soon flew away.

Either adult brooded the chicks, especially after some cause of alarm or during rain. Brooding of the chicks was last noted on 18 November when they were 24d old. When the duty bird was disturbed by approaching people it called to the chicks which then ran to the shelter of a small cave in rocks behind the nest site, and hid there until the danger had passed. On only three out of more than 40 observed disturbances did a chick 'freeze' in the open rather than run to the cave. On these occasions the

chick was more than 10 m from the cave when the adult called to it and the human was already very near. The chick then crouched motionless and did not stir even when touched.

On 23 November, when the chicks were 30 d old, one was seen flying across the river to join a parent; it then flew a short distance down-river with the adult. The second chick did not fly but called repeatedly to the adult and its sibling and ran on to a sloping rock face and hid in a crevice. The following day both juveniles were in the nest area and ran to their old cave when disturbed but, on 25 November, both flew to the cave when I approached; a second time they ran.

Both adults and juveniles were seen together for the next two days, often away from the nest area. Then one juvenile disappeared together with an adult. The second juvenile was last seen on 7 December. Thus, the young birds first flew 30-32 d after hatching but remained with their parents for up to ten days more. This compares with *C. pecuarius* which is independent in about 30 d (Harrison 1975). It is remarkable that during the 30 d prior to flying, the chicks mostly remained in a limited area of about 15 m² in the vicinity of the nest. This area was bounded by cliffs and water but the chicks could wade across the river and did occasionally do so, although never venturing far from the river. No doubt the continual human disturbance in the wadi and the safety of the small cave, plus the abundance of aquatic food enabled the chicks to survive in such a restricted area. In fact, it was the only place along the stretch of river where the chicks could have avoided being trampled.

An adult plover, presumably of the same pair watched since June, was behaving suspiciously at its old breeding area on 13 December and, on 15 December another nest containing two eggs was found close to the site of the previous one. Incubation continued until 20 December when one egg was broken by guerillas; the nest was then deserted. This pair of Three-banded Plovers clearly laid three clutches within six months, the second of these being a repeat clutch. This is the first evidence that Three-banded Plovers are multiple-brooded.

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